

Appl. No.: 10/763,647
Amdt. dated 10/14/2005
Reply to Office action of 07/15/05

REMARKS/ARGUMENTS

In the Office Action dated July 15, 2005, Claims 1-25 are pending. The Office Action rejects Claims 13, 17-19, and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over the admitted state of the prior art in view of U.S. Patent No. 5,893,683 to Johnson. In addition, the Office Action rejects Claims 1-12, 14-16, 20, and 25 under 35 U.S.C. § 103(a) as being unpatentable over the admitted state of the prior art in view of Johnson and further in view of U.S. Patent Application Publication No. 20030100242 to Annigeri et al. and U.S. Patent Application Publication No. 20020168241 to David et al.

Applicants have amended independent Claims 1 and 13 to further patentably distinguish the cited references. Claim 3 has been amended and Claim 17 has been cancelled in light of the amendments to independent Claims 1 and 13, respectively. Therefore, in light of the claim amendments and subsequent remarks, Applicants respectfully request reconsideration and allowance of the claims.

A. Independent Claims 1 and 13

Independent Claim 1 has been amended for clarification and to further distinguish each of the cited references, taken alone or in combination. Claim 1 recites a method for repairing a workpiece. The method includes providing a workpiece having a defect and an area proximate to the defect and routing a portion of the workpiece including the defect such that routing removes at least a portion of the workpiece proximate to the defect. The routing step includes controlling a depth to which the workpiece is routed with a micro-stop countersink apparatus, and Claim 1 has been amended to recite that routing further comprises controlling the routing such that at least a portion of the routed portion of the workpiece is defined by a conical bottom surface. The method further includes flame spraying the portion of the workpiece that has been removed by routing such that new material is added to fill the portion of the workpiece that has been routed.

Independent Claim 13 of the present application has also been amended to further clarify and distinguish the cited references. In particular, Claim 13 recites a method for repairing a

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workpiece that includes providing a workpiece having a defect and an area proximate to the defect and plunging a router bit into the portion of the workpiece including the defect. The router bit contacts the defect and the area proximal to the defect in a direction generally orthogonal to the workpiece to remove a portion of the workpiece including the defect such that the routing removes at least a portion of the workpiece proximate to the defect. Moreover, independent Claim 13 has been amended to recite that the routed portion is defined by a sidewall extending generally orthogonal to the workpiece and a conical bottom surface extending from the sidewall. The method also includes flame spraying the portion of the workpiece that has been removed by routing such that new material is added to fill the portion of the workpiece that has been routed.

B. The Cited References

The Examiner relies upon the Background of the present application as admitted state of the art in combination with the cited references to reject the claims. The Background of the present application generally describes repairing surface defects in aircraft skin such as by using flame spraying techniques. Johnson discloses an indexable insert router that includes a drive shank and a cutter head. Chip gullets are milled in the cutter head and provide a flat surface where pockets are milled in the flat surfaces for two plate-like inserts. Each insert includes a major face, i.e., rake face, which is a generally flat rectangular plate. Each insert includes diagonal cutting edges at opposite corners, a bottom cutting edge, and a side cutting edge. Moreover, Johnson discloses that the cutter may be advanced axially and incrementally in a plunging cut, as well as moved laterally.

Annigeri discloses a method for removing a damaged substrate region beneath a coating. In particular, Annigeri discloses that the method includes assessing the damage of a substrate, determining a three-dimensional profile of the outer surface of the substrate, establishing a three-dimensional grinding profile, and grinding along the profile such that the damaged substrate is substantially removed without significantly removing undamaged portions of the substrate. Furthermore, David discloses a router apparatus for removing damaged portions of an

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aircraft skin. The router rides on a platform and may be guided to make controlled vertical and horizontal cuts to remove layers of the aircraft skin.

C. The Rejections of Independent Claims 1 and 13 under 35 U.S.C. § 103(a) are Overcome

Applicants submit that independent Claims 1 and 13 are distinguishable from each of the cited references, taken individually or in combination. In particular, none of the cited references, taken individually or in combination, disclose controlling the routing such that a routed portion includes at least a conical bottom surface, as recited by Claim 1, or a routed portion that is defined by a sidewall extending generally orthogonal to the workpiece and a bottom surface extending from the sidewall, as recited by Claim 13. As shown in FIG. 7 and 7a of the present application, the routed portion includes a sidewall and conical bottom surface. Conversely, and as shown in Figure 5 of Johnson, the routed portion includes a vertical sidewall and a horizontal bottom surface joined by a rounded edge within the workpiece, which is specifically distinguished in the Background of the present application. More specifically, the Background of the present application on page 2, lines 13-16 states that “[i]t was also believed that the edges of the area routed and the undamaged area needed to be smooth to minimize stress concentrations. As such, sharp edges created by the router bit within the aircraft skin were undesirable because of the potential for stress concentrations (See Figure 1).” Figure 5 of Johnson clearly shows a routed portion that includes rounded edges, which is unlike the claimed invention, where sharp edges may be formed between the sidewall and the conical bottom surface. Thus, less undamaged material is wasted when rounded edges are not formed when routing the workpiece. Furthermore, neither Annigeri nor David discloses a specific profile of the routed portion and, thus, also do not teach or suggest a routed portion having at least a conical bottom surface.

Johnson states that the opposite corners of the cutting edges may be left square like that shown at the lower end of Figure 4a (col. 2, lines 64-65). Even assuming that “left square” corresponds to an angular cutting edge, Johnson does not teach or suggest forming a conical bottom surface within the workpiece. In fact, Johnson discloses that the cutter head includes an

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axial depression that would prohibit the cutting inserts from forming a conical bottom portion in the workpiece. Johnson discloses that the axial depression "in the form of a truncated cone is turned in the end face to provide clearance for the ramping entry of the router into the workpiece at the angle α indicated in FIG. 1 and again in FIG. 5" (col. 2, lines 44-47). As such, the combination of the truncated cone and flat bottom cutting edge of Johnson teach away from forming a routed portion having a conical bottom surface defined in the workpiece, as recited in independent Claims 1 and 13.

As neither reference discloses controlling the routing such that a routed portion includes at least a conical bottom surface, or a routed portion that is defined by a sidewall extending generally orthogonal to the workpiece and a bottom surface extending from the sidewall, the combination of the references also fails to teach or suggest independent Claims 1 and 13 of the present application. Therefore, the rejections of independent Claims 1 and 13 under 35 U.S.C. § 103(a) over the cited references are overcome. As such, it is submitted that dependent Claims 1-12 and 14-25 are allowable for at least those reasons discussed above with respect to independent Claims 1 and 13, respectively.

CONCLUSION

In view of the amendments and remarks presented above, Applicants submit that the present application is in condition for allowance. As such, the issuance of a Notice of Allowance is therefore respectfully requested. In order to expedite the examination of the present application, the Examiner is encouraged to contact Applicants' undersigned attorney in order to resolve any remaining issues.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required

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therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit
Account No. 16-0605.

Respectfully submitted,

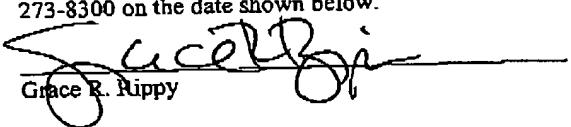


Trent Kirk
Registration No. 54,223

Customer No. 00826
ALSTON & BIRD LLP
Bank of America Plaza
101 South Tryon Street, Suite 4000
Charlotte, NC 28280-4000
Tel Charlotte Office (704) 444-1000
Fax Charlotte Office (704) 444-1111

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Grace R. Rippy

October 14, 2005
Date